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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/631,129
Filing Date: July 31, 2003
Appellant(s): YOUNGPETER ET AL.

Paul Godwin
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed September 12, 2007 appealing from the
Office action mailed February 7, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows: the filing of the Terminal Disclaimer

on August 15, 2008 has been considered and approved. Therefore the rejections set forth under non-statutory obviousness-type double patenting have been withdrawn.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,860,797	Fujimura et al	1-1999
4,877,099	Duffy	10-1989

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimura et al in view of Duffy.

Fujimura et al disclose a power steering pump (Fig. 4 and Field of the Invention in Col. 1). Comprising a housing (1 in Figs. 1-3) defining a bore (15 in Fig. 3) having an

axis (coaxial with the arrow labeled DISCHARGE in Fig. 3) and an outlet (18a) at one end of the bore. There is a fluid discharge port (1b) communicating with the bore at a first axial location (note Fig. 3) and a fluid bypass port (1a) communicating with the bore at a second axial location. The pump is defined by pumping elements comprising a cam chamber (the cam is item 10 and the chamber is item 12 in Fig. 2) with a rotor (5) having retractable vanes (11) disposed within the cam chamber (Fig. 2). There is a flow control valve (16) slidably received within the bore and defining an inlet to the bypass port (the spool valve has a valve section 16d which along with the chamber 24 forms a step, as the plunger slides leftwards in Fig. 3 it progressively and proportionally moves against the spring 17 to open a fluid path to bypass port 1a, thus the right edge of section 16d defines an inlet to the bypass port (see col. 4 lines 64 to col. 5 line 8)). The entire larger diameter portion of the valve 16 forms a plunger which is responsive to the hydraulic pressure to slide the valve to various positions between fully closed (Fig. 3) and fully open, maximum flow position (col. 5 lines 5 and 6). Fujimura et al also discloses a sleeve (18) received in the bore (see Fig. 3) and having an opening (18b in the Fig. 3 embodiment, the embodiments of figures 6-9 show similar openings). The flow control valve is slidably received in the sleeve and has an opening (24, again defined by the step from the large diameter face 16b of the plunger and the smaller diameter section 16a, an opening is "an open space serving as a passage or gap" "The American Heritage Dictionary, Second College Edition"). The flow control valve opening communicates with the fluid bypass port (1a) when the valve (16) is moved to the left in Fig. 3. The portion 18a of the element forms a tubular extension including an endcap

(that portion outside the bore 15) which is sealingly (18c) mounted to the housing at the open end of the bore. The plunger has a pressure equalization passage (16ac) extending from the rear end (the right end of Fig. 3) and communicating with fluid adjacent (at 24) the flow control valve.

Fujimura does not disclose that the plunger is responsive to an applied electromagnetic field to slide the flow control valve, that the spring biases the valve into the open position or that there is an electromagnetic coil for applying an electromagnetic field to the plunger.

Duffy discloses a similar power assist system for a vehicle having a pump driven by an engine which delivers to a pressure fluid to a steering system (16). There is a bypass throttle valve (18) designed to direct fluid from the pump outlet (12) back to the pump inlet (14). The valve is shown in Fig. 3 and includes a plunger (62) which is responsive to an applied electromagnetic field generated by a coil (60) to proportionally control the fluid communicated to the bypass port (56) which communicates to the pump inlet. The electromagnetic force generated by the coil is controlled by controller (22). The coil and electromagnetic force is counteracted or acts against a spring force from a spring (58) which biases the valve into the open position (see col. 3 lines 28-40). Duffy additionally discloses that the coil forms an extension and is mounted to the outside of the housing at the bore opening for applying an electromagnetic field to the plunger (62).

At the time of the invention it would have been obvious to one of ordinary skill in the art to substitute an electromagnetic coil, plunger and control arrangement such as

taught by Duffy for the hydraulic system of Fujimura as a control system which allows precise control of the valve system in response to multiple inputs and variables (for example, vehicle speed 40 and steering pressure 20) and to fine tune the power assist for a variety of driving conditions (see Duffy Abstract).

(10) Response to Argument

The applicant makes the following arguments with regards to the rejection set forth under 35 USC 103(a).

1. The applicant argues that combination of the Fujimura et al and Duffy references is insufficient in view of the claim language and that they do not suggest a steering pump with the elements of the combination as set forth in the claims. The applicant argues that the examiner did note that Fujimura et al does not disclose an electrical means for sliding the valve however the applicant notes that Fujimura et al also fails to disclose a plunger that is responsive to an applied electric field to slide the valve or a spring which biases the valve open. With respect to Duffy the applicant provides a simplified analysis of this system and states that it is merely a throttle valve that opens and closes a by-pass path in a pump system.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

With respect to the Fujimura et al this reference does disclose a hydraulically actuated plunger to proportionally open and close the valve that uses a spring as a biasing mechanism. Obviously since the plunger is acted on hydraulically it does not teach of the electrical actuation means (the coil, plunger which is acted upon by the electric field and a spring biasing the valve open). However, all of these limitations are clearly shown and taught by the electrical means for sliding the valve of the Duffy reference. Duffy does not merely disclose a solenoid driven valve. It discloses a coil (60) mounted at the end of a valve bore and a plunger (solenoid armature 62) which is responsive to the electric field of the coil and is biased into an open position by a spring (58). Further the valve of Duffy does not merely move between open and closed positions but rather proportionally moves to vary the bypass flow (as does Fujimura et al's).

2. The applicant argues that there is no suggestion to combine the references. The applicant argues that in Fujimura et al the "concept employed uses the principle of preventing bypass flow when the system is at rest and only opening up the by-pass flow path in response to pump fluid pressure" and sets forth there is no suggestion to add electrical control. Again the Duffy reference is characterized as merely a solenoid operated throttle valve.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention

where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, each of Fujimura et al and Duffy are directed to bypass valve control arrangements for providing proper flow between the pump outlet and a bypass of the positive displacement pump in a power steering system.

The examiner notes that the applicant has mischaracterized Fujimura et al by stating that the "concept employed uses the principle of preventing bypass flow when the system is at rest and only opening up the by-pass flow path in response to pump fluid pressure". The "concept employed" in Fujimura et al is not concerned with keeping the bypass closed at rest. Rather the Fujimura et al devise is directed to quickly bringing the power steering pump delivery up to the proper flow rate and then bypassing the additional flow generated back to the pump instead of the steering mechanism (see Fig. 5). This is the common method of operating power steering systems. In power steering systems the pump is generally driven directly by the engine and designed so that at a low speed proper operating flow and pressure will be provided. Then as the engine speed goes up progressively more and more of the pump output (because the pumps are positive displacement) must be bypassed to maintain the desired condition. The same thing is happening in the Duffy reference (note col. 1 lines 38-40, col. 2 lines 4-6 and col. 3 lines 12-19 for example). Duffy recognized that by using an electronically controlled and actuated bypass flow control valve, having the elements set forth in the

claims of the instant invention, a more precise control of the power steering system could be obtained. In particular a variety of variables could be taken into consideration, such as steering pressure and vehicle speed and optimum steering pressures could be obtained for the entire range of driving conditions (see col. 2 lines 27-35). Clearly each of Fujimura et al and Duffy are directed to providing an optimized power steering flow and Duffy teaches that by using an electronic control optimum power steering for any and all driving conditions can be obtained. This is a clear suggestion from within the same field of art to one of ordinary skill to utilize electrically actuated valving.

3. The applicant also makes an argument that Fujimura et al teaches away from the claimed invention because the spring in that device is biased towards the closed position.

The examiner disagrees. This spring is part of the hydraulic actuation system of Fujimura et al and would be replaced by the spring disclosed and taught as part of the electrically actuated valve in Duffy. That a single element of the Fujimura et al hydraulic actuator operates different from the claimed invention would not teach away when it is the entire hydraulic actuator system which is going to be replaced by the Duffy electrically actuated valve which has a spring biasing as claimed by the applicant.

4. The examiner notes that the applicant also makes a reference to the Fujimura et al spool valve being elongated but not uniform in diameter (page 5 line 16).

It is noted that the features upon which applicant relies (i.e., the uniform diameter) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

5. The applicant argues that the skill level and knowledge that one skilled in the art must have to make the combination set forth by the references has not been alleged or presented.

The examiner disagrees. The references are clearly written to a person having an ordinary skill in the power steering art. As the teaching of the references show such a person would have knowledge of hydraulic and fluidic systems as well as knowledge of electrical and control systems. These systems, and in particular the pressure adjusted valves, the electrically controlled valves and the operation of throttling type valves, is very well developed and understood by those of ordinary skill in the art. Furthermore, one of ordinary skill in that art would have a reasonable expectation of success with regards to combining the teachings of such references.

6. The applicant also makes an argument with regards to it being unclear what structural modifications to the chambers and elements of each of the references would have to be made and how the coils would be incorporated.

In response to applicant's argument that it is unclear how the various parts and chambers would be integrated, the test for obviousness is not whether the features of a

secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

7. The applicant argues "that broad concept of adding electrical control to a bypass valve is not what is claimed in the application."

The examiner agrees but notes that the applicant has mischaracterized the rejection being made. The rejection is not merely the addition of an electrical control but is instead the substitution on an electrically actuated valve for a hydraulically actuated valve. The Duffy reference in disclosing the electrically actuated valve also teaches that this allows for the use of an electric control of the actuation system with very advantageous results. This provides a clear rational for combining the applied references.

For the reasons set forth above it is believed that the rejections should be sustained.

Respectfully submitted,

/Charles G Freay/

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